

CRINIA TSCHUDI (ANURA: LEPTODACTYLIDAE) FROM THE CAINOZOIC OF QUEENSLAND, WITH THE DESCRIPTION OF A NEW SPECIES

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Summary

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The leptodactylid frog *Crinia presignifera* sp. nov. is described from a series of Oligo-Miocene sites at Riversleigh Station in northwest Queensland. This finding represents the first record of the genus *Crinia* from the Tertiary and the first record of fossil material of *Crinia* from Queensland. *Crinia remota* Tyler & Parker is reported from a Quaternary cave deposit at Riversleigh Station.

KEY WORDS: *Crinia*, ilia, Leptodactylidae, Cainozoic, Queensland, Australia.

Introduction

The genus *Crinia* Tschudi, including frogs referred to *Ranidella* Girard (according to Heyer *et al.* 1982), is a group of 12 small, ground-dwelling species that live close to water. It is represented in all but the arid, central portion of Australia, and the central coastal area of Western Australia. One species (*C. remota* (Tyler & Parker)) occurs in northern Australia and southern New Guinea.

The genus *Crinia* has been the subject of diverse studies, particularly in the fields of polymorphism and of pre-mating isolating mechanisms. Consequently, published data on this genus are more substantial than those available for any other genus in Australia.

The phylogenetic relationships and the origin of *Crinia* are unclear. Morphological evidence (Heyer & Liem 1976; Davies 1989) suggests a close relationship with *Pseudophryne* Fitzinger and *Uperoleia* Gray.

The current fossil record of *Crinia* consists of the extant species of *C. signifera* Girard, from Pleistocene deposits at Henschke's Cave and Victoria Cave, in the southeast of South Australia (Tyler 1977), and the extant species *C. georgiana* Tschudi from Pleistocene deposits at Skull Cave and Devil's Lair in the extreme southwest of Western Australia (Tyler 1985).

Here I report the first Tertiary record of *Crinia*, and the first Quaternary record of *Crinia* from Queensland. The genus *Crinia* occurs at several Cainozoic sites at Riversleigh Station in northwest Queensland. Previously, two other leptodactylid genera have been reported from that area: *Lechriodus* Boulenger (Tyler 1989) and *Limnodynastes* Fitzinger (Tyler 1990).

Material and Methods

The material is deposited in the Queensland Museum, Brisbane (QM) and the South Australian Museum, Adelaide (SAM). Letters following the abbreviations are departmental identifications.

Comparative studies were based on the osteological collections at the Department of Zoology, University of Adelaide.

Osteological nomenclature and methods of measurement follow Tyler (1976, 1989).

Systematics

Family: Leptodactylidae Werner, 1896

Sub-family: Myobatrachinae Schlegel, 1850

Genus: *Crinia* Tschudi, 1838

At the time of the preparation of a description of the ilial characteristics of Australian frogs by Tyler (1976), *Crinia* was considered a monotypic genus, and *Ranidella* distinct from it. The principal morphological features distinguishing *C. georgiana* from the species of *Ranidella* examined (*R. parinsignifera* and *R. signifera*) were considered to be the extent of the dorsal protuberance, and the presence of a very slight longitudinal indentation upon the lateral surface of the ilial shaft of *Crinia* that was absent from the *Ranidella* species (Tyler 1976).

Examination of these particular features in additional species formerly referred to *Ranidella*: *bilingua*, *deserticola*, *glauerti*, *insignifera*, *pseudinsignifera*, *remota* and *riparia* indicates that the generic differences proposed by Tyler (1976) cannot be sustained. Nevertheless, and perhaps more significantly, despite its larger adult size, it is evident that *C. georgiana* has a more robust ilium than the species of *Ranidella* so far examined, in which the ilial shaft proportionately is deeper and more substantial than in those species that are now its congeners.

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Diagnostic generic features of *Crinia* are the curved and medio-laterally flattened shaft, lacking a dorsal crest and possessing a very slight medial indentation; large acetabular fossa with a broad peripheral rim; slight development of the ventral acetabular expansion and a subacetabular zone that does not protrude anteriorly. The dorsal acetabular expansion is poorly developed. The dorsal prominence is low and the dorsal protuberance slightly developed.

Crinia presignifera sp. nov.

FIG. 1A

Holotype: QM F17630. A left ilium collected at Wayne's Wok Site, Riversleigh Station, northern Queensland.

Description of holotype: Iliac shaft slender and slightly curved. Lacks dorsal crest but with moderately deep, slight lateral concavity along proximal one-third of shaft. Distal end of iliac shaft incomplete inferiorly.

Acetabular fossa large and deep, with prominent, elevated rim. Dorsal margin of acetabular fossa superior to inferior margin of iliac shaft. Pre-acetabular zone evenly rounded, expanding inferiorly into protruding rounded flare of sub-acetabular expansion. Inferior margin of sub-acetabular expansion lacking.

Dorsal acetabular expansion raised slightly.

Dorsal prominence poorly developed. Dorsal protuberance narrowly oval, prominent, projecting laterally.

Length of ilium: 6.3 mm.

Paratypes: There are 18 paratypes - Outsite Site: QM F17634-36, 18155, SAM P31230-33; Quentin's Quarry Site: AM F17631; Neville's Garden Site: QM F18156-58, SAM P31234-35; Two Trees Site: QM F17632, SAM P31228; Camel Sputum Site: QM F17633, SAM P31229.

The largest of the specimens in which the iliac shaft is complete measures 7.1 mm. A paratype is shown in Fig. 1.

Throughout the series the dorsal prominence and dorsal protuberance are conspicuous, and the dorsal acetabular expansion is elevated only slightly. The acetabular fossa is consistently large, but the breadth of the adjacent pre-acetabular zone varies from extremely narrow (at its closest proximity to the fossa) to moderately wide. The ventral acetabular expansion is incomplete in most specimens.

Comparison with other species: The overall similarity in external morphology of species of *Crinia* (excluding *C. georgiana*) is accompanied by an extreme conservatism in the form of the ilium. Most of the specific characters are slight, when



Fig. 1. A. *Crinia presignifera* sp. nov. paratype: QM F17630; B. *Crinia remota* SAM P31236.

compared with those distinguishing members of other genera e.g. *Limnodynastes* and *Litoria*. Nevertheless one feature distinguishing *C. presignifera* from congeners is the narrow pre-acetabular zone clearly demonstrated by comparison with *C. remota* in Fig. 1. Amongst extant species the one with the narrowest pre-acetabular zone is *C. signifera* but even in that species it is far more substantial than in the new species.

Stratigraphy and lithology: In the Riversleigh Station area Archer, *et al.* (1989) recognised a minimum of five types of Oligo-Miocene carbonates that are rich in bones. The sites bearing *C. presignifera* comprise two sequences of lacustrine carbonates that contain principally non-aquatic local faunas. These collectively are referred to by them as "System B" and "System C".

Etymology: In adding pre- (*l.*, *prae*) as a prefix to *signifera* I am alluding to the ancestral nature of the fossil species relative to extant species.

Crinia remota (Tyler & Parker)

Fig. 1B

Material: A single right ilium, SAM P31236 from Carrington Cave, Riversleigh Station, Queensland.

Descriptive notes: The iliac shaft is cylindrical and the terminal portion is missing. Existing length 4.6 mm. The superior portion of the dorsal acetabular expansion is missing. The ventral acetabular expansion is broadly expanded.

Comments: *Crinia remota* (Tyler & Parker 1974) was described from southern Papua and is now known to occur also in northern Queensland and the Northern Territory including Melville Island and Groote Eylandt (Tyler *et al.* 1985, in press). The present specimen does not differ from specimens examined and is the first fossil record of the species.

Carrington Cave is situated in a hill adjacent to the Gregory River. The specimen was found near the surface of a vast mound of fragmented bones derived from the excreta of the ghost bat *Macroderma gigas*, and is located approximately 100 m from the entrance to the cave.

The age of the deposit is unknown but it is presumed to be Holocene or Late Pleistocene.

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